U.S. soybean production
+
biotechnology
=
increased sustainability

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Royal Overseas League
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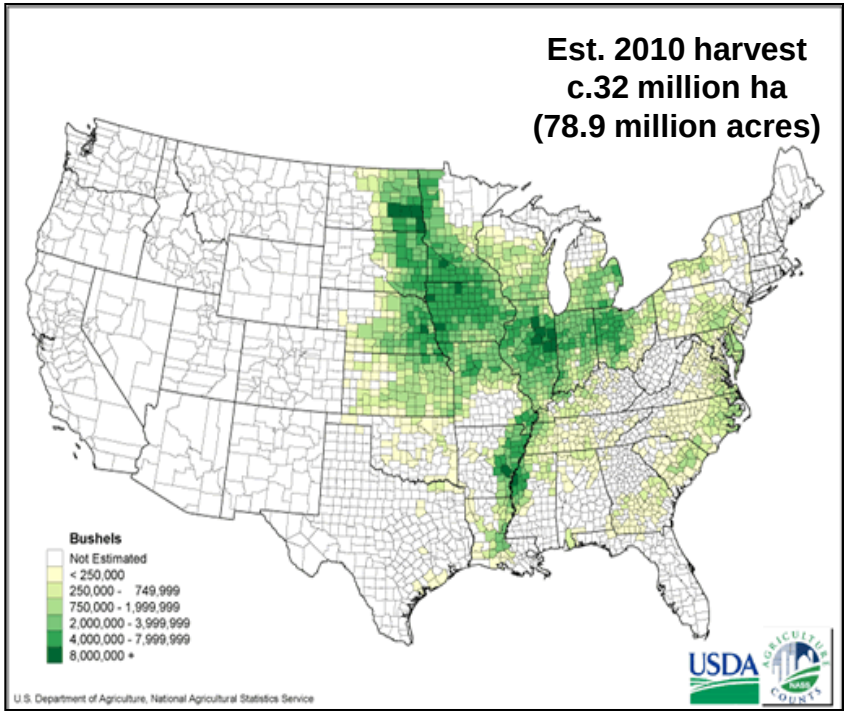
U.S. Soybean Production

Soybeans are grown primarily across 29 states

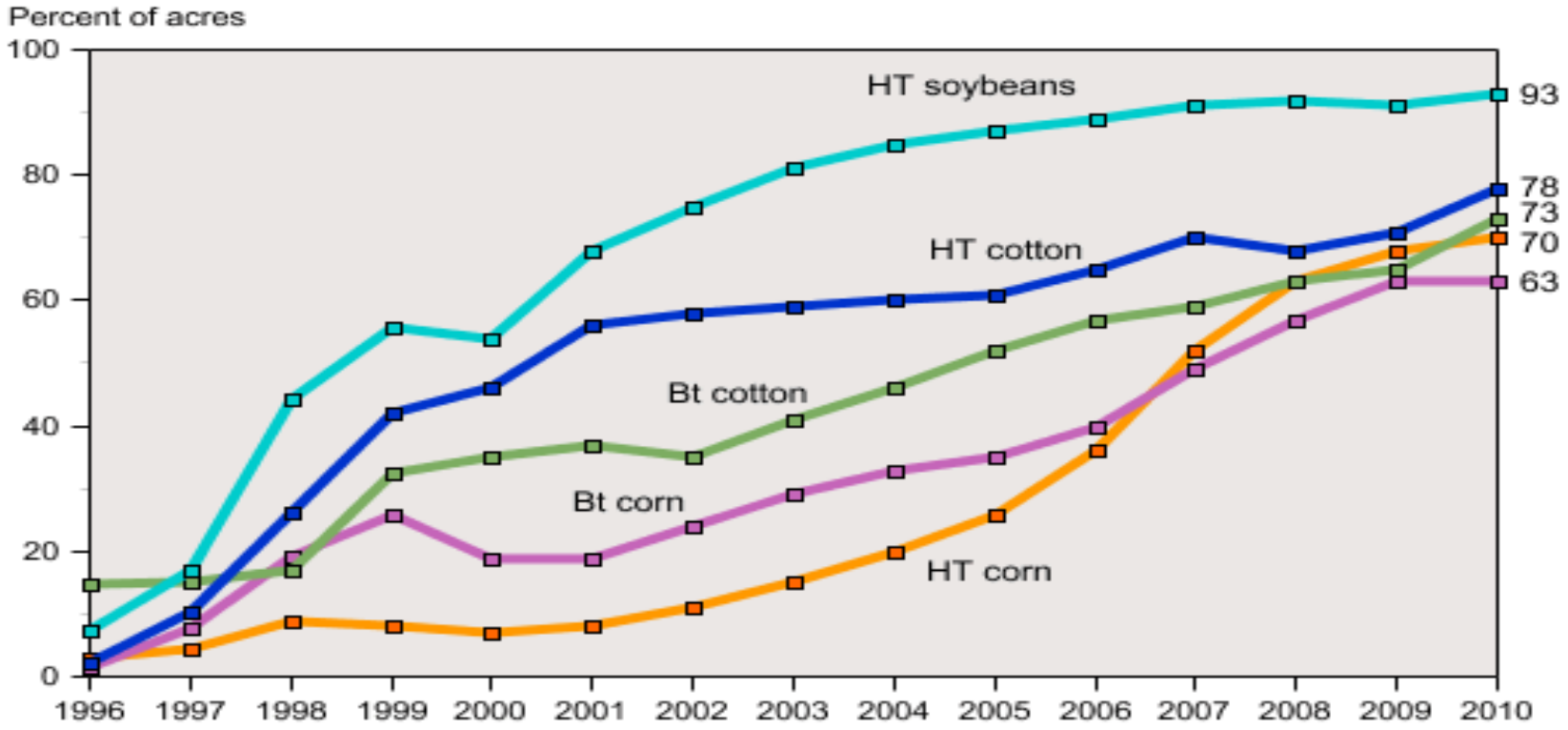
About half of U.S. production is used domestically and the rest is exported

2010 harvest yields are expected to be an all time record from 32 million ha



Adoption of biotech crops in the U.S.

Rapid growth in adoption of genetically engineered crops continues in the U.S.



Data for each crop category include varieties with both HT and Bt (stacked) traits.
Sources: 1996-1999 data are from Fernandez-Cornejo and McBride (2002). Data for 2000-10 are available in the ERS data product, Adoption of Genetically Engineered Crops in the U.S., tables 1-3.

Why We Use Biotech Crops On Our Farms
No-till + herbicide tolerant soybeans

Herbicide tolerant biotech soybeans means more flexibility in weed control

We can make more use of conservation tillage practices (e.g. no-till and reduced tillage) by planting seeds through the previous year's crop stubble

This old-crop residue creates a mulch layer which encourages earthworm and soil microbes and improves soil structure

Why We Use Biotech Crops On Our Farms

Environmental & Sustainability Benefits

- No-till + biotech helps to
  - Reduce soil erosion
    - 1 billion tonnes/year saved
  - Improve soil health
    - More carbon & nutrients kept in soil
  - Reduce surface impact
  - Reduce greenhouse gas emissions
    - 3.3 million tonnes less CO_2 released by 2020
    - Every litre saved reduces CO_2 emissions by 10kgs
    - Decrease in CO_2 emissions using no-till in 2008 equivalent to removing 125,750 cars from the road
  - Reduce water loss
    - Runoff reduced by 99% with no-till v traditional
  - Increase birdlife
  - Increase beneficial insects
  - Increase organic matter in topsoil

Why We Use Biotech Crops On Our Farms

Safer

- Herbicide tolerant
  - Reduces toxic chemicals
    - Annual herbicide use 11 million kgs less in biotech soybean production
    - Resulted in €1.2 billion annual production cost savings
  - Fewer sprayings
  - Less toxic weed seed
- Insect resistant (maize)
  - Chemical treatments not needed on Bt. maize seed
  - Mycotoxin 30-40 times lower than conventional maize

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Why We Use Biotech Crops On Our Farms

Profitable

- No-till + GM soybeans allow
  - Fuel savings (e.g. Iowa 365 ha farm)
    - *80 liters/ha to 32 liters/ha for soy*
    - *56 liters/ha to 37 liters/ha for maize*
  - Herbicide savings
  - Smaller tractors
  - Narrow row planting
    - *increased productivity*
  - Labor savings (e.g. Iowa 365 ha farm)
    - *440 hours/year*

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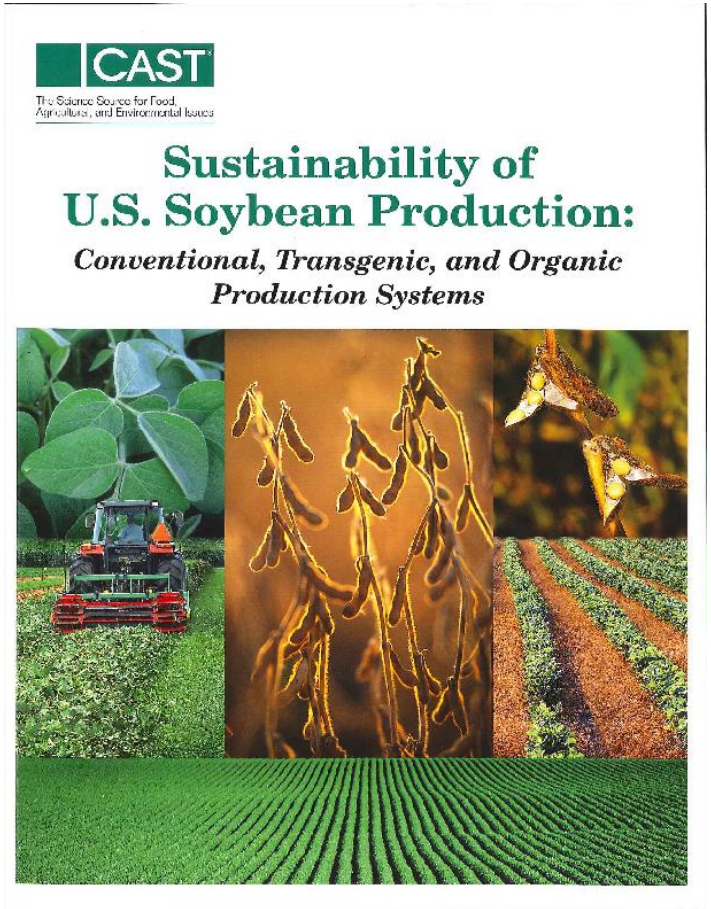
2009 CAST Publication

- The Council for Agricultural Science & Technology (CAST) carried out an 18-month study for the United Soybean Board to:
  - Address the ecological impacts of various U.S. soybean production systems
  - Compare the sustainability of conventional, organic and biotechnology-derived production systems



Main Conclusions 2009 CAST Report

- Biotech soybean production systems **are** the most widely used systems in the U.S.
- Traditional soybean production systems will decline
  - Reasons
    - Lack of herbicide availability
    - Lack of non-biotech varieties
    - Lack of price premiums
- Organic soybean production is sustainable but . . .
  - Price premium of $333 tonne+ required for profitability
  - Weed control challenges
  - Reduced yields (≈2.8 t/ha for organic vs. 4.6 t/ha for non-organic)

Next Generation Soybeans

2010

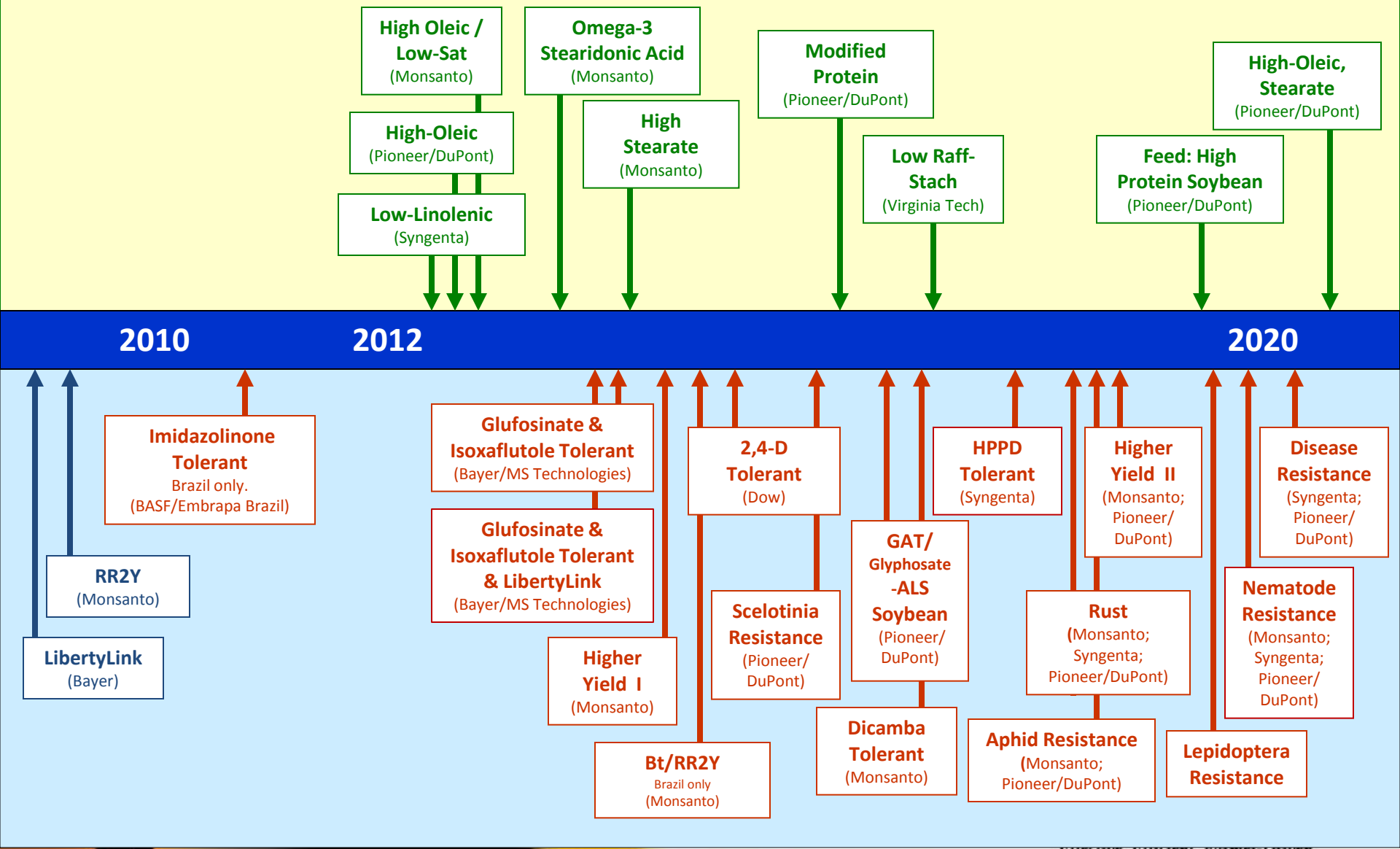
- Liberty Link
  - Alternative herbicide to glyphosate
- RoundupReady2Yield
  - Higher yield potential
- High oleic soybean
  - Increased levels of oleic acid reduces transfats

Next 3 to 5 years

- High omega-3
  - Much increased omega-3 levels for improved human health
- High stearic acid
  - Up to six times more than conventional with improved food processing benefits through reducing harmful fats

Soybean Industry Portfolio

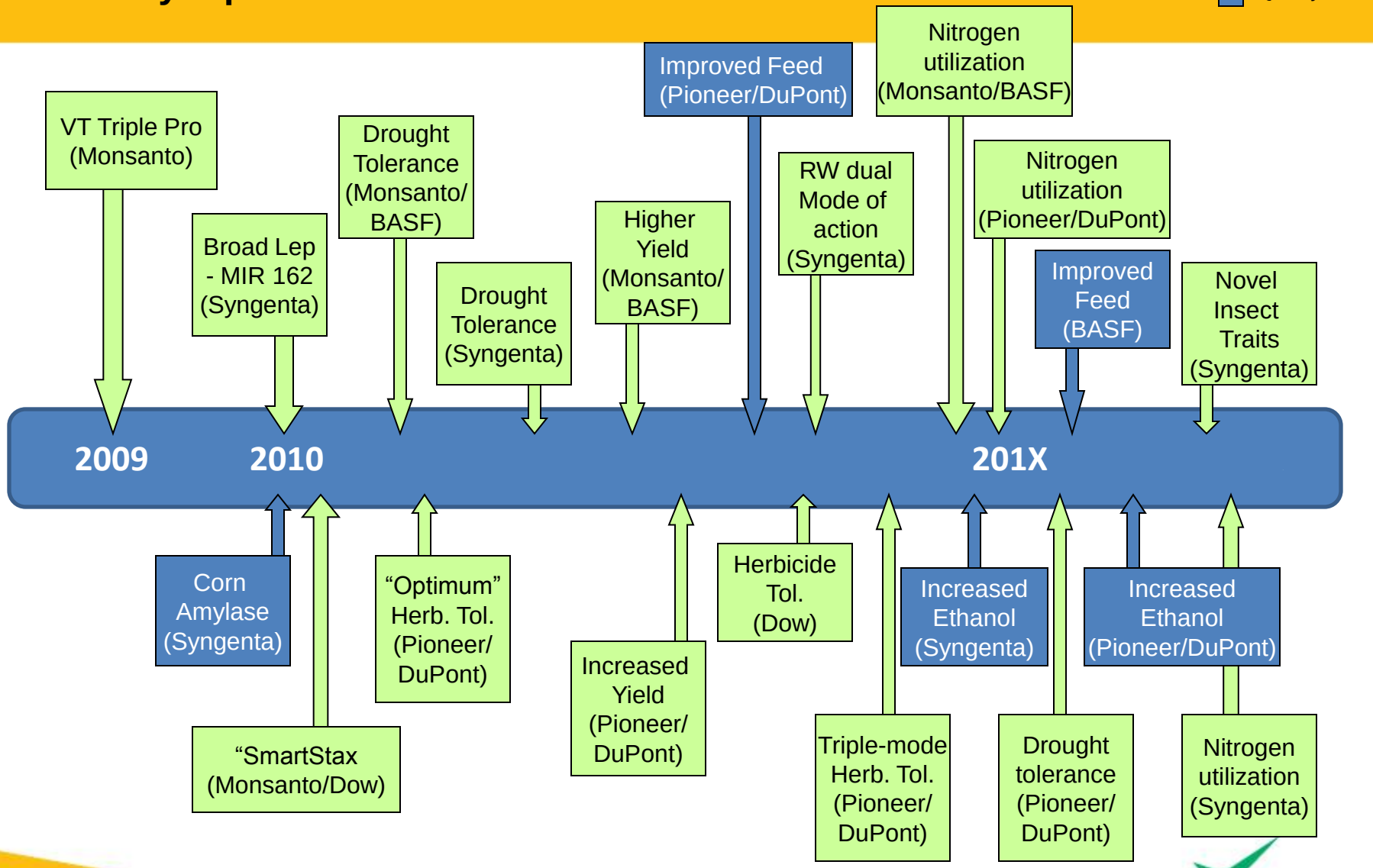
Pipeline of biotech events and novel trait releases



Source: Pipeline from Industry Sources; pr

Industry Corn Portfolio*

A Steady Pipeline of Events



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Current Soybean Production Issues

- Operational
  - Weed resistance to glyphosate
  - Reduced development of non-biotech varieties
- Technology
  - Small number of technology providers
- Trade
  - Asynchronous approvals leading to trade disruption

Thank You

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